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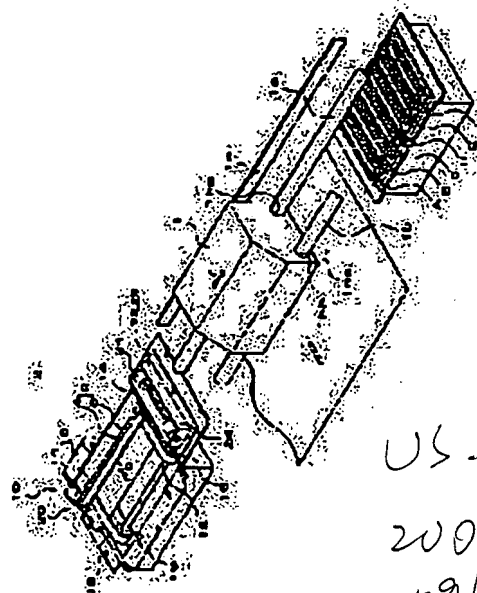
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**(54) MAINTENANCE MECHANISM FOR INK JET HEAD****(57)Abstract:**

**PROBLEM TO BE SOLVED:** To provide a maintenance mechanism for an ink jet head whereby a printed material is not contaminated by ink that remains by adhering to a lower end of a side face of an ink jet head and sticks on a paper face during printing.

**SOLUTION:** An ink collecting means 22 is provided to a side face of a wiping device 2 of the ink jet head 1 in a scanning region of the ink jet head 1. The main section of the ink collecting means 22 consists of an ink collecting roller case 26, a shaft 24a of which both ends are rotatably supported by right and left side walls 26a, 26b of the roller case 26 and a pair of ink collecting rollers 24, 24 each being pivoted to a portion in the vicinity of each of the right and left ends of the shaft 24a. A part of the inside of the pair of ink collecting rollers 24, 24 is disposed to be brought into contact with both ends of the ink jet head 1 under pressure. The ink collecting roller 24 is made of a porous elastic material such as a felt, a sponge, a laminated absorbent paper or an already-known polymer collecting material.



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**Notes:**

1. Untranslatable words are replaced with asterisks (\*\*\*\*).
2. Texts in the figures are not translated and shown as it is.

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Dictionary: Last updated 07/20/2007 / Priority: 1. Information communication technology (ICT) / 2. Electronic engineering / 3. JIS (Japan Industrial Standards) term

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## FULL CONTENTS

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### [Claim(s)]

[Claim 1] The wiper blade which consists of an elastic body, and the wiper blade holder holding a part of both-sides side of this wiper blade, or one side, It has the transportation device which carries out attitude movement of this wiper blade holder in the machine direction of said ink jet head. [ said wiper blade holder / the free end of said wiper blade / the state where you made it located in the position welded by pressure to the ink flash area of said ink jet head ] The machine direction of said ink jet head carries out attitude movement of said wiper blade holder. It is the maintenance mechanism of an ink jet head equipped with the wiping equipment of the ink jet head which \*\*\*\* said ink flash area. The maintenance mechanism of the ink jet head characterized by establishing an ink recovery means to contact said ink flash area, in the scan size of said ink jet head.

[Claim 2] The Maintenance mechanism of the ink jet head according to claim 1 characterized by said ink recovery means consisting of a porosity elastic body.

[Claim 3] The Maintenance mechanism of the ink jet head according to claim 2 characterized by said ink recovery means being a roller-like.

[Claim 4] The Maintenance mechanism of the ink jet head according to claim 3 characterized by establishing further an ink iris diaphragm means to contact said ink recovery means.

[Claim 5] The Maintenance mechanism of the ink jet head according to claim 4 characterized by said ink iris diaphragm means consisting of the porosity rigid body.

[Claim 6] The Maintenance mechanism of the ink jet head according to claim 4 or 5 characterized by said ink iris diaphragm means being a roller-like.

[Claim 7] The Maintenance mechanism of the ink jet head according to claim 4 or 5 characterized by said ink iris diaphragm means being the letter of a projection prepared in the inner wall of the ink recovery roller case.

[Claim 8] [ said ink recovery means ] when said ink jet head moves in the direction which keeps away from a printing area The Maintenance mechanism of the ink jet head according to claim 3 characterized by a motion of said ink jet head being interlocked with, and rotating, and not rotating when said ink jet head moves in the direction approaching a printing area.

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the maintenance mechanism of the ink jet head used for an ink jet printer.

[0002]

[Description of the Prior Art] The wiper blade which consists of elastic bodies, such as acrylonitrile-butadiene rubber (it is henceforth called NBR for short) from the former, and a fluororubber, The wiper blade holder which pinches a part of both-sides side of this wiper blade, The wiping equipment of the ink jet head which is made to move a wiper blade and an ink jet head relatively, and \*\*\*\* said ink flash area is known making the free end of a preparation and said wiper blade weld by pressure to the ink flash area of an ink jet head.

[0003] There is a method showing in one method of the wiping equipment of the aforementioned ink jet head at drawing 6 which is drawing 5 and the sectional side elevation which are a perspective view. [ the wiping equipment 2 of the ink jet head 1 in this method ] As shown in drawing 5 and drawing 6 the direction (the direction of arrow RO of drawing 5 --) which intersects perpendicularly with the scanning direction of said ink jet head 1 the wiper bread unit 8 which consists of a wiper blade 4 prolonged crosswise [ of the ink jet head 1 ] (the direction of arrow I of a figure), and a wiper blade holder 6 which pinches this It has the transportation device 10 which carries out attitude movement in the direction of arrow Ha of drawing 6 .

[0004] The wiper conveyance belts 12 and 12 of one pair of right and left with which said transportation device 10 fixed said wiper blade unit 8 to the upper surface, It consists of the drive pulleys 14 and 14 and the idler pulleys 16 and 16 which were built over the wiper conveyance belt of these right and left, and a wheel train 20 prepared between the axis of rotation of said drive pulleys 14 and 14, and the axis of rotation of the wiper drive motor 18. In addition, the free end of said wiper blade 4 is made to be located by height position which is welded by pressure to 1ns of ink flash areas of said ink jet head 1. You are made to scan it here by the cross direction of the ink jet head shown by arrow Ha of drawing 6 with the head conveyance belt 1c, a head 1 being guided at each of the guide shafts 1a and 1b which penetrate each of a pair of guide hole 1ha punched in parallel with the lower part, and 1hb.

[0005] You make it said ink jet head 1 located with the above composition, so that it may come right above said wiping equipment 2. The machine direction (the direction of arrow RO of drawing 5 , the direction of arrow Ha of drawing 6 ) of the ink jet head 1 is made to scan said wiper blade unit 8, and said 1ns of ink flash areas are \*\*\*\*(ed).

[0006] In addition, the signs A or F of drawing 5 are caps, and after the end of wiping operation of the above ink jet heads 1 It is made to go up so that the upper edge of Caps A or F may contact 1ns of ink flash areas of the ink jet head 1 as arrow NI of drawing 5 shows, and 1ns of ink flash areas are held to a damp or wet condition, or the role of the vacuum suction head for the initial restoration of ink to the ink jet head 1 is played.

[0007]

[Problem to be solved by the invention] By the above wiping methods of an ink jet head, as shown in drawing 6 (c), when a wiper blade 4 separates from 1ns of ink flash areas of the ink jet head 1, ink 21 will remain in the side lower end of an ink jet head. When this remaining ink 21 was neglected as it was, there was a problem of adhering to space during future printing and soiling a printing product.

[0008] This invention makes it a technical problem to offer the maintenance mechanism of the ink jet head of canceling the problem of said conventional technology, and the ink which adhered and remained in the side lower end of the ink jet head adhering to space during future printing, and soiling a printing product.

[0009]

[Means for solving problem] The wiper blade which the 1st mode of this invention which solved said technical problem becomes from an elastic body, The wiper blade holder holding a part of both-sides side of this wiper blade, or one side, It has the transportation device which carries out attitude movement of this wiper blade holder in the machine direction of said ink jet head. [ said wiper blade holder / the free end of said wiper blade / the state where you made it located in the position welded by pressure to the ink flash area of said ink jet head ] The machine direction of said ink jet head carries out attitude movement of said wiper blade holder. It is the maintenance mechanism of an ink jet head equipped with the wiping equipment of the ink jet head which \*\*\*\* said ink flash area. It is the maintenance mechanism of the ink jet head characterized by establishing an ink recovery means to contact said ink flash area, in the scan size of said ink jet head.

[0010] The 2nd mode of this invention is the Menten Nance mechanism of the ink jet head according to claim 1 characterized by said ink recovery means consisting of a porosity elastic body in said 1st mode.

[0011] The 3rd mode of this invention is the Menten Nance mechanism of the ink jet head characterized by said ink recovery means being a roller-like in said 2nd mode.

[0012] The 4th mode of this invention is the Menten Nance mechanism of the ink jet head characterized by establishing further an ink iris diaphragm means to contact said ink recovery means in said 3rd mode.

[0013] The 5th mode of this invention is the Menten Nance mechanism of the ink jet head characterized by said ink iris diaphragm means consisting of the porosity rigid body in said 4th mode.

[0014] The 6th mode of this invention is the Menten Nance mechanism of the ink jet head characterized by said ink iris diaphragm means being a roller-like in said 4th or 5th mode.

[0015] The 7th mode of this invention is the Menten Nance mechanism of the ink jet head characterized by being the projection to which said ink iris diaphragm means was prepared in the inner wall of the ink recovery roller case in said 4th or 5th mode.

[0016] [ the 8th mode of this invention ] when said ink recovery means moves in the direction in which said ink jet head keeps away from a printing area in said 3rd mode It is the Menten Nance mechanism of the ink jet head characterized by a motion of said ink jet head being interlocked with, and rotating, and not rotating when said ink jet head moves in the direction approaching a printing area.

(OPERATION) If constituted like said 1st mode, the ink jet head with which ink adhered to the side lower end with the wiping method of said conventional ink jet head will be collected and removed in the ink which was made to scan an ink recovery means [ to be established in the scan size and to contact an ink flash area ] top, and adhered.

[0017] Since an ink recovery means will consist of a porosity elastic body if constituted like said 2nd mode, the side lower end of an ink jet head is contacted reasonable, and adhesion ink can be collected and removed efficiently.

[0018] Since an ink recovery means will have the shape of a roller which consists of a porosity elastic body if constituted like said 3rd mode, it crosses to full [ of an ink jet head ], and adhesion ink can be collected and removed still more efficiently.

[0019] Since ink will be squeezed out by ink iris diaphragm means to weld by pressure to a roller-like

ink recovery means and it will return to an unsaturated condition with it even if saturated with the ink which the surface coat of the roller-like ink recovery means collected if constituted like said 4th mode, adhesion ink can be collected continuous still more efficiently. Moreover, since the relative motion between said ink flash area and the ink recovery means of the shape of said roller rolls and the next door sliding effect decreases, the endurance of the ink recovery means of the shape of said roller improves.

[0020] Since said ink iris diaphragm means will consist of the porosity rigid body if constituted like said 5th mode While being able to weld by pressure to a roller-like ink recovery means effectively, collecting ink efficiently and being squeezed out End \*\*\*\*\* , Inc. does not return to a roller-like ink recovery means again, the ink by an ink iris diaphragm means squeezes out, and it is efficient and recovery and removal of the ink by a roller-like ink recovery means can be performed continuously. In addition, after an ink iris diaphragm means is saturated with recovery ink, since the ink squeezed out from the ink recovery means of the shape of said roller is transmitted to the surface of an ink iris diaphragm means and flows and falls, the ink iris diaphragm picking effect of it is not lost.

[0021] Since said ink iris diaphragm means will be a roller-like or it will consist of the roller-like porosity rigid body if constituted like said 6th mode, the same operation as an operation of said 4th or 5th mode can expect still more efficiently.

[0022] Since said ink iris diaphragm means will consist of the porosity rigid body of the projection prepared in the inner wall of the ink recovery roller case, and the letter of the projection prepared in the inner wall of the ink recovery roller case if constituted like said 7th mode, the same operation as an operation of said 4th or 5th mode can expect efficiently.

[0023] If constituted like said 8th mode, generating of the bubble of the ink at the time of an ink recovery roller rotating in contact with an ink jet head can be prevented, and the dirt of the form by the burst of a bubble can be prevented.

[0024]

[Mode for carrying out the invention] The form of operation of this invention is described below with reference to attached Drawings.

[0025] The perspective view in which drawing 1 shows the entire configuration of the form of operation of the 1st of the maintenance mechanism of the ink jet head of this invention, the right sectional view in which drawing 2 shows the composition of the 1st of the principal part of the form of operation of the maintenance mechanism of the ink jet head of this invention, and drawing 3 are the A-A \*\*\*\*\* sectional side elevations of drawing 2 .

[0026] In addition, the same sign is shown in the same component part as the component part of the wiping equipment of the conventional ink jet head explained with reference to said drawing 5 and drawing 6 in the figure, and duplication explanation is omitted.

[0027] The form of operation of the 1st of the maintenance mechanism of the ink jet head of this invention is the side of the wiping equipment 2 of the ink jet head 1 of said drawing 5 , as shown in drawing 1 , and it is arranging the ink recovery means 22 in the scan size of an ink jet head.

[0028] As the ink recovery means 22 is shown in drawing 1 or drawing 3 , the ink recovery roller case 26, The principal part consists of a pair of ink recovery rollers 24 and 24 supported to revolve near the right-and-left both ends of the shaft 24a held for both ends at the side walls 26a and 26b of right and left of this ink recovery roller case 26 enabling free rotation, and this shaft 24a. A pair of these ink recovery rollers 24 and 24 are arranged so that a part of that inner side may weld by pressure with the both ends

of the ink jet head 1.

[0029] This ink recovery roller 24 is formed from porosity elastic bodies, such as felt, sponge, a laminating blotting paper, and a well-known polymer absorber.

[0030] furthermore, [ the lower part of the aforementioned ink recovery roller 24 ] The ink iris diaphragm means which consists of an ink squeezing roller 28 of \*\*\*\*\* so that it may weld by pressure with this is supported to revolve by the side wall of the right and left of the ink receiver tank 30 in which the both ends were established by the bottom of the right-and-left both ends of said ink recovery roller case 26 pivotable, and is formed in it. The ink absorber 32 is stored by the bottom of the ink receiver tank 30.

[0031] The aforementioned ink squeezing roller 28 is formed from the rigid body of a well-known sintering porous body or a foaming porous body, for example.

[0032] Moreover, the anything which catches ink according to capillarity, such as foam, Kanebo UETTORON, or a nonwoven fabric made from pulp made from urethane, the aforementioned ink absorber 32 is good, or does not need to form the ink absorber 32 in particular, for example.

[0033] Operation and an operation of the form of operation of the 1st of the maintenance mechanism of the ink jet head of this invention constituted as mentioned above are explained below.

A. Move a wiper blade unit in the direction of either of arrow RO of drawing 1 after making it the wiping ink jet head 1 of an ink jet 1 located right above the wiping equipment 2 of drawing 1 . As a result, when a wiper blade 4 separates from 1ns of ink flash areas of the ink jet head 1, as shown in drawing 3 , ink 21 will remain in either of the right-and-left both-sides sides of the ink jet head 1, or both side lower ends.

B. Make the ink jet head 1 scan in the direction of either of arrow I of removal (1) drawing 1 of the remains ink 21 of the side lower end of the ink jet head 1, a direction perpendicular to the space of drawing 2 , and the direction of arrow HO of drawing 3 , and pass the ink recovery means 22 top. Then, [ the partial top end inside the ink recovery roller 24 which consists of a porosity elastic body being welded by pressure to 1ns of ink flash areas of the ink jet head 1, as shown in drawing 2 ] It rotates, as the ink recovery roller 24 shows arrow HE of drawing 3 , and the remains ink 21 of the side lower end of the ink jet head 1 is collected.

(2) As the ink squeezing roller which consists of the porosity rigid body welded by pressure to the lower part of the ink recovery roller 24 shows by arrow TO of drawing 3 with rotation of the ink recovery roller 24, rotate. As a result, the ink currently collected by the surface coat of the ink recovery roller is squeezed out, it moves to the direction of an ink squeezing roller, and the surface coat of an ink recovery roller returns to the unsaturated condition of ink.

(3) If the surface coat of an ink squeezing roller will collect ink and will be in the saturation state of ink, the squeezed-out ink 21b (refer to drawing 3 ) is transmitted to it, will flow down the surface of an ink squeezing roller, and it will be collected by the ink recovery object 32.

[0034] Next, the form of operation of the 2nd of the maintenance mechanism of the ink jet head of this invention is explained below with reference to attached Drawings.

[0035] Drawing 4 is some sectional side elevations of the form of operation of the 2nd of the maintenance mechanism of the ink jet head of this invention.

[0036] The form of this operation is the same if the composition of the form of the 1st operation explained with reference to said drawing 1 or drawing 3 and the following point are removed.

[0037] Namely, although the ink squeezing roller 28 welded by pressure to the ink recovery roller 24 was used as an ink iris diaphragm means in the form of the 1st operation In the form of this operation, it replaced with said ink squeezing roller 28, and as shown in drawing 4 , the ink iris diaphragm projection 34 which becomes the inner wall of the ink recovery roller case 26 from the porosity rigid body which the tip welds by pressure to said ink recovery roller is provided.

[0038] [ an operation of the form of this operation constituted as mentioned above ] the case where it is presupposed that the ink squeezing roller 28 is read as the ink iris diaphragm projection 34, and this ink iris diaphragm projection 34 is interlocked with rotation of the ink recovery roller 24 like the ink squeezing roller 28, and does not rotate in explanation of an operation of the form of the 1st operation, and abbreviation -- since it is the same, duplication explanation is omitted.

[0039] Next, the 3rd embodiment of the maintenance mechanism of the ink jet head of this invention is explained below.

[0040] In the 1st or 2nd embodiment, after the ink recovery roller 24 rotates in contact with the ink jet head 1, when separating from the ink jet head 1, the bubble of ink may be generated and the bubble may adhere to the ink jet head 1. The bubble adhering to the ink jet head 1 explodes, when the ink jet head 1 moves onto a print form, and it may soil space. A \*\*\*\* form prevents it.

[0041] With reference to Drawings, it explains below. This embodiment has composition which prepared for the composition of the embodiment 1 the roller stopper 35 which regulates rotation of the ink recovery roller 24, as shown in drawing 7 . Drawing 8 is the perspective view showing a roller stopper's 35 composition. A roller stopper 35 bends a PET film (0.125mm in thickness), and is made. Sheet material with elasticity, such as a polyimide film, and a polycarbonate, urethane, is sufficient as material. Moreover, you may mold and create plastics, such as polypropylene, polyethylene, and polyacetal. What is necessary is just to choose according to the property of ink, the quality of the material of the ink recovery roller 24, hardness, etc., if thickness Seki is carried out.

[0042] As shown in drawing 7 , a roller stopper 35 is positioned by the grade by which the stopper section 35a eats into the ink recovery roller 24, and is bent, and is stuck on the ink recovery roller case 26. The amount of bending is set as an adequate amount which the ink recovery roller 24 rotates only to one way in contact with the ink jet head 1.

[0043] As shown in drawing 9 (a) with the above composition, when the ink jet head 1 moves in the direction which keeps away from a printing area Since the ink recovery roller 24 has the small rotation load received from a roller stopper's 35 stopper section 35a, it takes to the ink jet head 1, and the surroundings carry out, an unsaturated condition is made efficiently, and power of absorption is maintained. On the other hand, as shown in drawing 9 (b), when the ink jet head 1 moves in the direction approaching a printing area, since it is the direction which the stopper section 35a stretches, the ink recovery roller 24 does not rotate. Therefore, the bubble of ink is not generated but the dirt of a form can be prevented.

[0044] Although it had composition which bends a PET film, creates a roller stopper 35, and is fixed to the ink recovery roller case 26 in this embodiment, it is also possible for it not to be limited to this and to make the stopper section 35a by integral moulding with the ink recovery roller case 26. Moreover, as shown in drawing 10 , a denture mold is formed in the shaft 24a of the ink recovery roller 24, and it is realizable even if it applies the member which works as a stopper to the denture mold. That is, the ink recovery roller 24 is pivotable to one way, and if it is the structure which can control another side-



oriented rotation, the same effect will completely be acquired.

[0045]

[Effect of the Invention] According to the maintenance mechanism of the ink jet head of this invention, the ink which adhered and remained in the side lower end of the ink jet head adheres to space during future printing, and it is not said that a printing product will be soiled.

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[Brief Description of the Drawings]

[Drawing 1] It is the perspective view showing the entire configuration of the form of operation of the 1st of the maintenance mechanism of the ink jet head of this invention.

[Drawing 2] It is the right sectional view showing the composition of the 1st of the principal part of the form of operation of the maintenance mechanism of the ink jet head of this invention.

[Drawing 3] It is the A-A \*\*\*\*\* sectional side elevation of drawing 2 .

[Drawing 4] It is the sectional side elevation showing the composition of the 2nd of the principal part of the form of operation of the maintenance mechanism of the ink jet head of this invention.

[Drawing 5] It is the perspective view of one method of the wiping equipment of the conventional ink jet head.

[Drawing 6] It is the sectional side elevation of one method of the wiping equipment of the conventional ink jet head.

[Drawing 7] It is the sectional side elevation showing the composition of the 3rd of the principal part of the form of operation of the maintenance mechanism of the ink jet head of this invention.

[Drawing 8] It is the perspective view showing a roller stopper's composition in the form of operation of the 3rd of the maintenance mechanism of the ink jet head of this invention.

[Drawing 9] It is the explanatory view showing operation of the form of operation of the 3rd of the maintenance mechanism of the ink jet head of this invention.

[Drawing 10] It is the sectional side elevation showing the composition of the 4th of the principal part of the form of operation of the maintenance mechanism of the ink jet head of this invention.

[Explanations of letters or numerals]

A-F Cap

1 Ink Jet Head

1ns Ink flash area

1a, 1b Guide shaft

1ha, 1hb Guide hole

1c Head conveyance belt

2 Wiping Equipment

4 Wiper Blade

6 Wiper Blade Holder

8 Wiper Blade Unit

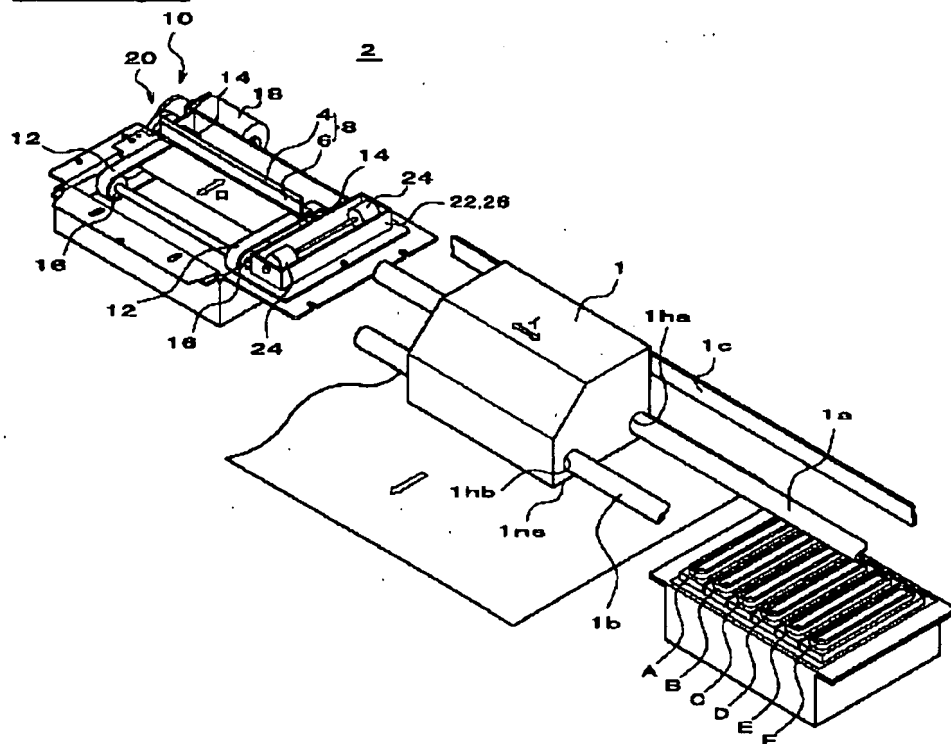
10 Transportation Device

12 Wiper Conveyance Belt

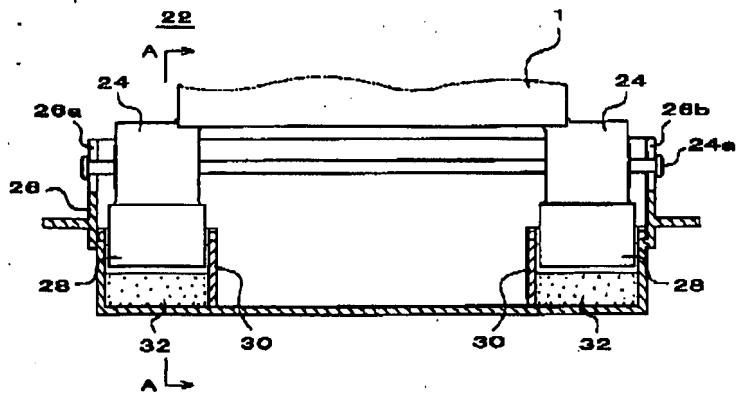
14 Drive Pulley

- 16 Idler Pulley
  - 18 Wiper Drive Motor
  - 20 Wheel Train
  - 21 21b Ink
  - 22 Ink Recovery Means
  - 24 Ink Recovery Roller
  - 24a Shaft
  - 26 Ink Recovery Roller Case
  - 28 Ink Squeezing Roller
  - 30 Ink Receiver Tank
  - 32 Ink Absorber
  - 34 Ink Iris Diaphragm Projection
- 

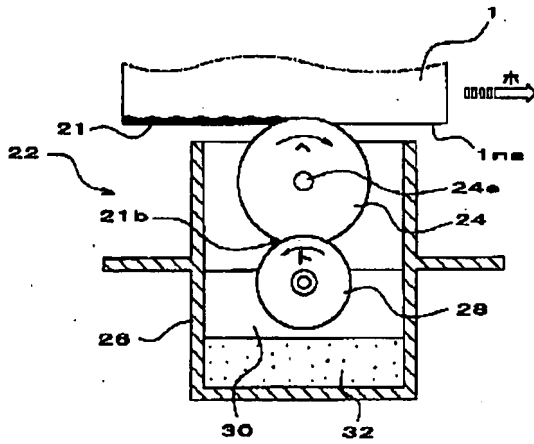
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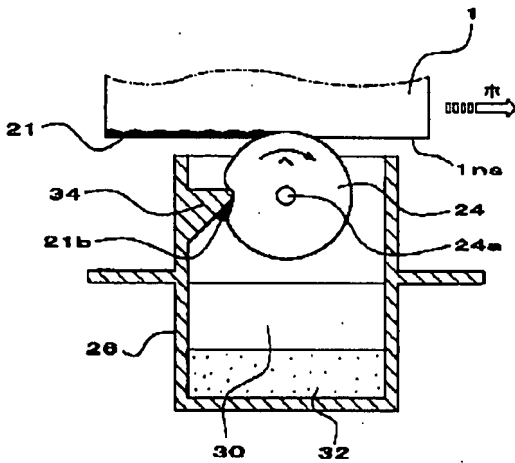
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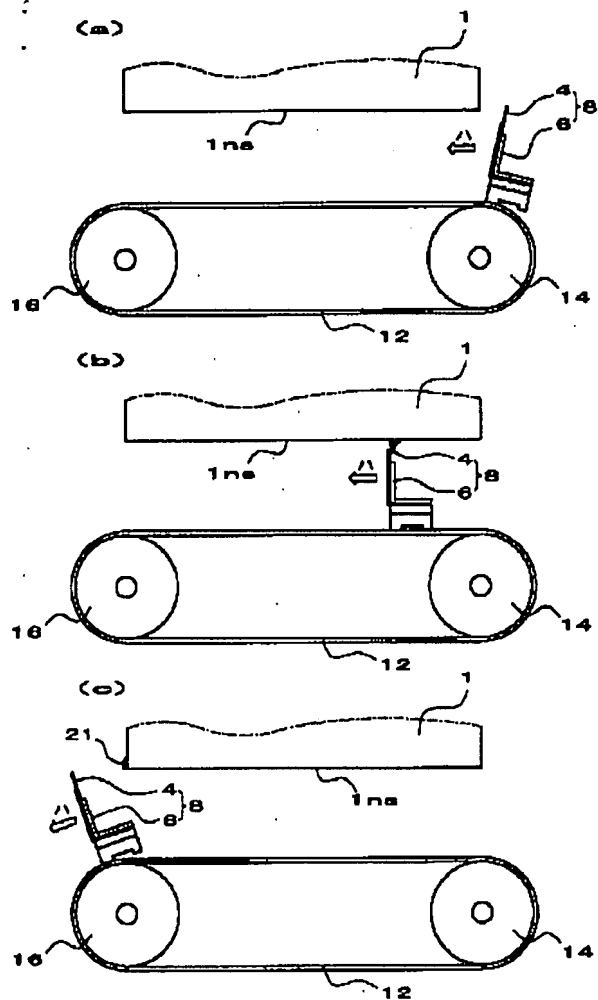
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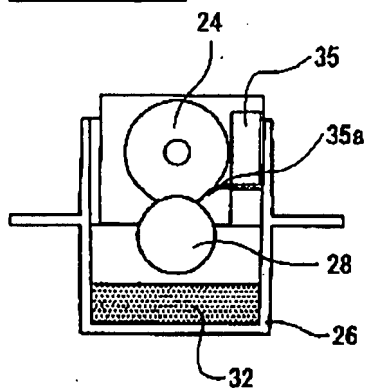
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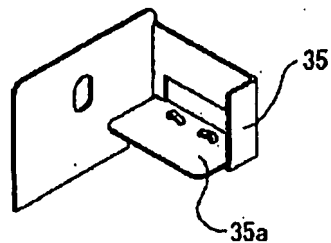
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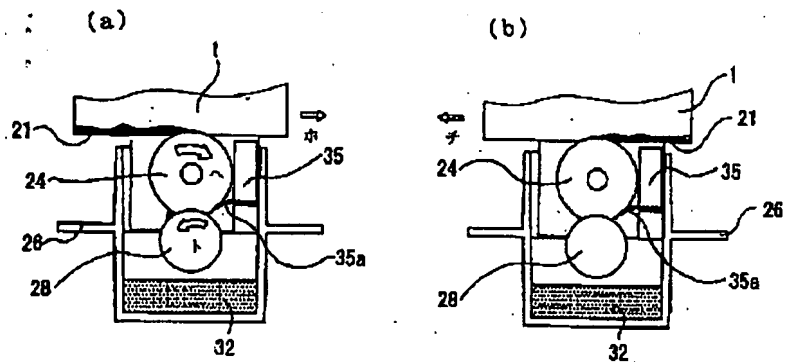
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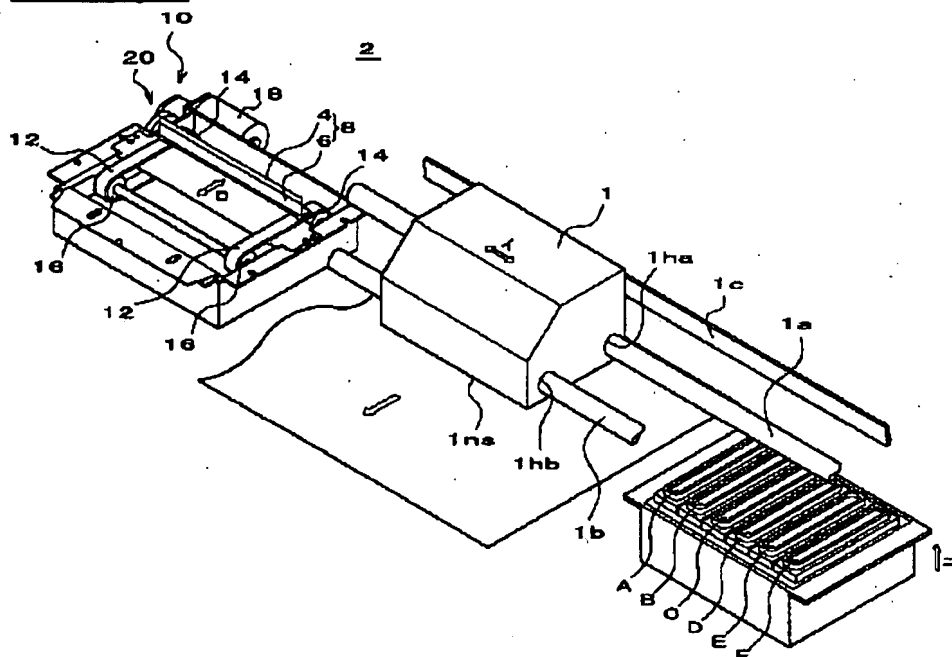
[Drawing 8]



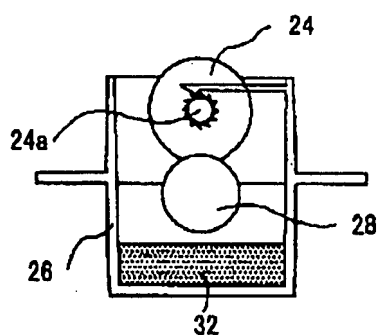
[Drawing 9]



[Drawing 5]



[Drawing 10]



[Translation done.]